Mart Cart
Model 3563
Technical Overview

This document is a technical overview of the Mart Cart model 3563. Its purpose is to describe the major components of units that are currently being produced. Some components may be updated from previous versions of this model. Some optional components may not be discussed in this document. For more detailed information, please contact our Service Department at 800-548-3373 or email techservice@assembledproducts.com.

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Major Parts Overview

- Battery/Circuit Breaker
- Charger
- Wire Harness
- PWM
- Control Box
- Hub Motor

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Battery/Circuit Breaker

The battery is a 12 volt, AGM (Absorbent Glass Mat), 35 Amp Hour, Sealed Lead Acid (SLA) battery.

280-1214

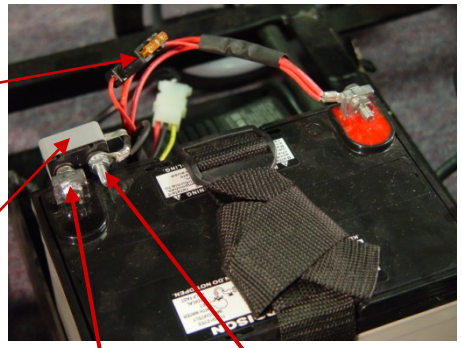
The “quick change” battery cover houses the 15 amp circuit breaker, 5 amp fuse, and main wire harness.

280-1712

260-1228

280-1799
(Mini Fuse)

280-1627 (Fuse)



Prior to the quick change battery cover, a 15 amp circuit breaker was attached directly to the negative post of the battery. The copper terminal of the circuit breaker is attached to the battery terminal with a lock nut. The black wire lead of the main wire harness is attached to the stainless steel terminal of the circuit breaker.

280-1610

Copper

Stainless

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Charger

The charger is a 12 volt, 7amp charger with Intelli-Charge™ functionality.

Intelli-Charge monitors the charge capacity of the battery. The charger shuts down when then battery is completely charged. This feature allows the battery to be plugged into a wall socket for any length of time without concern about over-charging.

The charger has 3 output wires and is plugged directly into the main wire harness with a 3-pin connector. The positive and negative wires go to the battery, and an “inhibit” wire goes to the PWM.

The inhibit wire carries voltage to the PWM on pin 7 when the charger is plugged in and charging the battery. Voltage on pin 7 “inhibits” the PWM from outputting voltage to the motor thus not allowing the cart to be operated when the charger is plugged in.

Note: The charger uses power cord 280-1797. The previous version of the charger uses power cord 280-1647 (“D” Plug).

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Wire Harness

Main – part of the quick-change battery cover assembly. Contains 15 amp circuit breaker and 5 amp mini fuse.

Steering – includes 6-pin, 3-pin, and 10-pin connectors, clamps and 18 inch loom (not shown).

PWM-to-Motor - includes 4-pin connector.

280-1712

280-1202

280-1646

280-1626
(Wire Guide)

280-1454

The earlier version of the main wire harness without the quick-change battery cover contains a 15amp circuit breaker and 5amp fuse.

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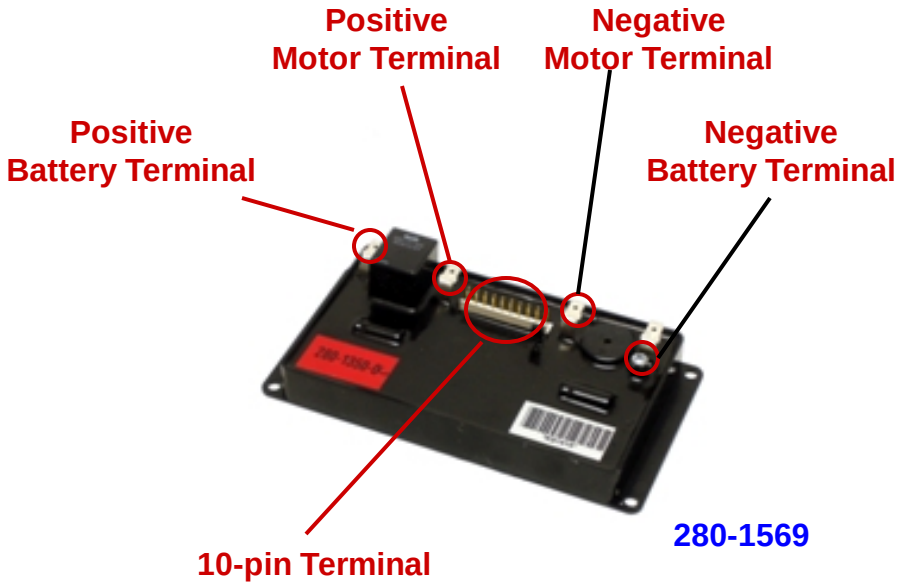
PWM

The PWM (Pulse Width Modulator) monitors multiple electronic functions and is the central processor for the cart's electronics. The PWM (in conjunction with the potentiometer) controls the speed and direction of the motor hub.

A 10-pin terminal is designed to monitor the cart's functions through the control box, charger, and motor.

10-pin terminals

1 – Black – Pin 1 on pot (ground)
2 – Yellow – Pin 2 on pot (wiper)
3 – Blue – Pin 3 on pot (terminal)
4 – Green – LED
5 – Orange – LED
6 – White – Common (power)
7 – Yellow – Inhibit from charger
8 – Violet – Horn
9 – Brown – Brake
10 – Not used



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Control Box

The control box houses the potentiometer and rocker switch (Power Off/On, Horn, LED light).

The potentiometer is connected to the control throttle and regulates the resistance on pins 1, 2, and 3 of the PWM. This, in turn, controls the speed and direction of the motor.

The rocker switch has an imbedded LED that indicates the battery charge process when the charger is plugged in and indicates the battery charge level while the cart is in service.

When charging

Amber - Charging
Green - Charged

When in service

Green - Good Charge
Amber - Moderate Charge
Red - Low (needs charging)

Note: The control box has optional configurations. Please call the Service Department for detailed information.

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Hub Motor

The hub motor is a direct current, brushed disc, 12 (or 24) volt brake, geared motor.

The motor is powered through a positive (red) and a negative (black) wire lead protruding from the axle.

The brakes are powered by two black wire leads protruding from the opposite axle.

The wire leads are pinned and inserted into a 4-pin connector. The brake leads are inserted into slots 1 and 2. The negative power lead is inserted into slot 3 and the positive lead (red) is inserted into slot 4.

280-1600

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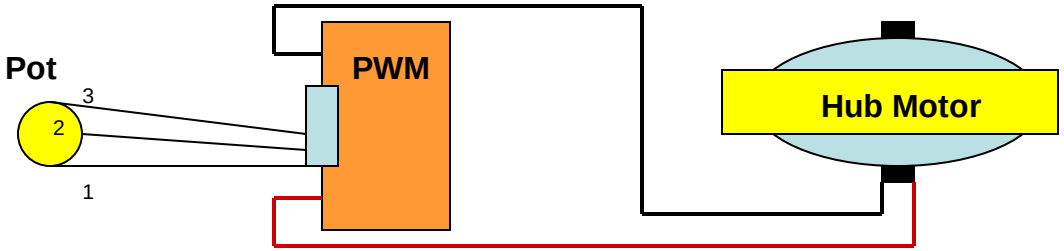
Potentiometer/PWM Relationship

The potentiometer (pot) along with the PWM regulates the speed and direction of the motor. The PWM monitors the change in resistance on pins 1, 2, and 3 of the 10-pin connector which are connected to the pot (pins 1, 2, and 3 respectively) through the steering wire harness. The pot is located in the control box and is physically connected to the throttle control on the cart's handlebars. The resistance is varied by the movement of the thumb-control throttle in a forward and backward direction.

In turn, the PWM emits variable voltage to the positive and negative motor leads (connected to the PWM), allowing the motor to move at varied speeds forward and backward.

The pot is rated at 5K ohms +/- 10%. This is the resistance between pin 1 and pin 3 on the pot's terminals. When the pot assembly is set at the factory, the wiper (pin 2) is calculated and preset to 24% of the total resistance (approx 1.08K to 1.32K ohms). The wiper position of the pot is where the PWM looks for the "neutral" position. In the neutral position, the PWM cuts power to the motor leads and brake leads (engaging the brake).



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Potentiometer/PWM Relationship

Over the life of the cart, several things may happen to disrupt the normal resistance between the pot and the PWM…subsequently sending false readings to the PWM. They are:

- The resistance material in the pot becomes damaged (extremely rare).
- The shaft sticks/freezes (human error during assembly).
- The spring or fork of the pot assembly become damaged.
- The connectors of the steering wire harness loose contact.
- The wires of the steering wire harness break.

When any of these situations occur, the PWM (movement of the cart) may act erratically. Often, the PWM is diagnosed as having a problem when, in fact, a problem exists with the pot, connectors, or wire harness.

The PWM is "calibrated" (see next page "Calibrate PWM") at the factory to the neutral range of the pot. If the pot assembly or wires become damaged, the resistance (and neutral range) of the pot can change. Re-calibrating the PWM may resolve the immediate problem but the fix may not be permanent. The best practice is to validate the condition of the pot, connectors, and wire harness before attempting to re-calibrate the PWM.

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Calibrate PWM

On occasion, the cart may function erratically. As the last step in troubleshooting a problem, the PWM can be “calibrated” to the neutral position of the potentiometer. Be certain that the battery is charged above 10.5 volts and the horn and the seat switch are connected and working properly before attempting to calibrate the PWM. Without them working properly, the PWM will not calibrate.

1. Stand next to the cart. Do not sit on the seat during the calibration steps.
2. Turn the rocker switch to the “ON” position (and the key switch if so equipped).
3. Be sure that the throttle is in neutral position (hands off).
4. Hold down the horn button for a minimum of 10 seconds. Do **not** let off of the horn.
5. While continuing to hold down the horn, push down and then release in the center of the seat (activating seat switch) 3 times.
6. Wait a second or two and then release the horn.

If you hear 2 short chirps, the PWM calibrated successfully. Retest the cart.

If you hear 3 short chirps, the PWM did not recognize a brake circuit (see the next page “Check Brake Lead”).

If you hear a long chirp in any combination, the PWM did not calibrate successfully. Calibrate again or replace the PWM.

Turn on sound and click video

Continue on next page

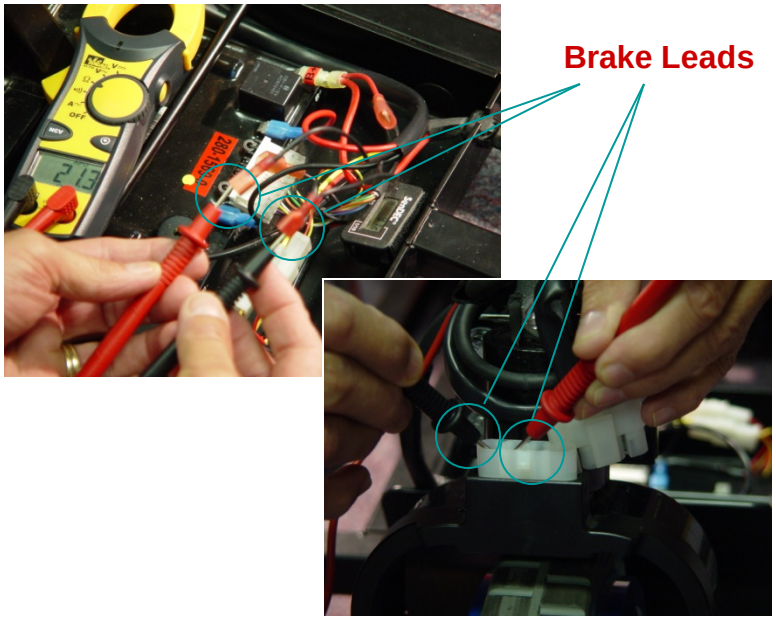
Calibrate PWM – Check Brake Leads

When attempting to calibrate the PWM one might hear 3 short chirps. This indicates that the PWM did not recognized a brake circuit. The PWM will still function but the brakes will not release causing undesired performance from the motor. To resolve the brake issues, check the brake circuit from the PWM to the motor by disconnecting the brake leads from the wire harness at the PWM and placing an ohm meter on each lead. The meter should read approximately 20 ohms.

If you do not get a good reading, run the same test on brake leads from the motor to the 4-pin connector.

If you do not get a good reading there, either the male pins in the connector are bad or the brake circuit inside the hub motor is bad…repair the pins or replace the motor.

If you get a good reading, then the PWM-to-Motor wire harness is bad or the pins in the 4-pin connector are not making good contact…repair the pins or replace the harness.



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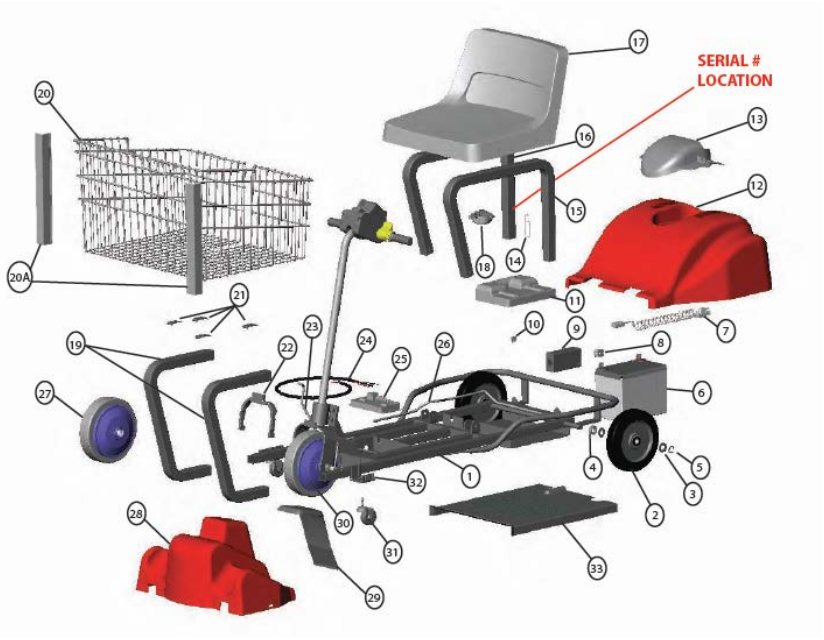
Parts List



Item	Part#	Description
1	280-1818	Main Frame (contains Bumper/hardware)
1a	280-1840	Bumper Only (with hardware)
2	280-1268	Rear Wheels – Poly-U, 8”
3	000-1224	Bushing – 5/8” (1 on each wheel)
4	280-1335	Grommet – 5/8” (1 on each wheel)
5	000-1075	Retaining Ring “E” Type (1 on each wheel)
6	280-1214	Battery – 35AH
7	280-1797	Charger Cord – 6’ Coiled (**See Notes**)
8	260-1228	Circuit Breaker – 15amp (**See Notes**)
9	280-1743	Charger – 7AMP, 3-Prong Pigtail
10	280-1799	Fuse, Mini – 5AMP (**See Notes**)
11	280-1712	Battery Cover Assembly – (**See Notes**)
12	280-1280	Rear Cover (Select Color Options)
13	280-1637	Charger Cord Cover
14	280-1711	Spring Latch Assembly
15	280-1262	Seat Mount Tube – LH
16	280-1261	Seat Mount Tube – RH
17	280-1797	Seat, PVC-Free (includes Seat Switch)
17A	200-1558	Seat, Padded (Optional – includes Seat Switch)
18	280-1553	Seat Switch (for PVC-Free Seat 280-1797)
18A	280-1484	Seat Switch (for Padded Seat 200-1558)
19	280-1264	Basket Tube (2 each)
20	200-1802	Basket, Lil Max
20A	280-1614	Basket Bumpers – 15” (2 each)
21	200-1236	Basket Mounting Clips (4 each)
22	280-1626	Wire Guide (**See Notes**)
23	280-1202	Wire Harness – Steering
24	280-1646	Wire Harness – Hub Motor to PWM (**See Notes**)
25	280-1569	PWM (Pulse Width Modulator)
26	280-1454	Wire Harness – Main (part of Battery Cover Assembly)
27	280-1346	Tire for Hub Motor
28	280-1279	Front Cover (Select Color Option)
29	280-1441	Bridge Cover
30	280-1600	Hub Motor
31	200-1052	Caster – 2” (2 each)
32	280-1273	Fork Assembly
33	280-1281	Floor Cover
	Steering Column/Controls (**See Detail on next page**)	

Notes:

7	Use Charger Cord 280-1647 (“D” plug) if cart has 280-1630 charger (older version).
8	Use Circuit Breaker 280-1610 if cart **does not have** the Battery Cover 280-1712.
10	Use Fuse 280-1627 if cart **does not have** a Battery Cover 280-1712.
11	Battery Cover Assembly 280-1712 contains Main Wire Harness, Fuse, and Circuit Breaker.
22	Wire Guide Assembly (280-1656) contains Wire Guide (280-1626), Wire Harness (280-1646), and Hardware.
24	Wire Guide Assembly (280-1656) contains Wire Guide (280-1626), Wire Harness (280-1646), and Hardware.
26	Order this part only if cart **does not have** Battery Cover 280-1712.

Optional Parts

Part#	Description
290-1123	Jr Basket
280-1373	Jumbo Basket (w/castors and lower shelf)
200-8153	Folding Produce Tray
280-1562	Chek-Riter
280-1653	Safety Flag
200-1393	Cord Reel – 6’
280-1178	Hour Meter
200-1728	Crutch Holder Assembly
280-1440	Seat Latch Hook Assembly

Decals/Signs (English – call for other)

Part#	Description
200-1382	Sign – Operating Instructions
200-1387	Sign – Personal Injury
200-1231	Sign – No Children
200-1299	Decal – Personal Injury
200-1095	Decal – Load Limits
280-1307	Decal – Pull Latch
000-1183	Decal – High Voltage
280-2103	Decal – Do Not Stand
280-1545	Decal – Charging Instructions
280-1532	Decal – Daily Maintenance

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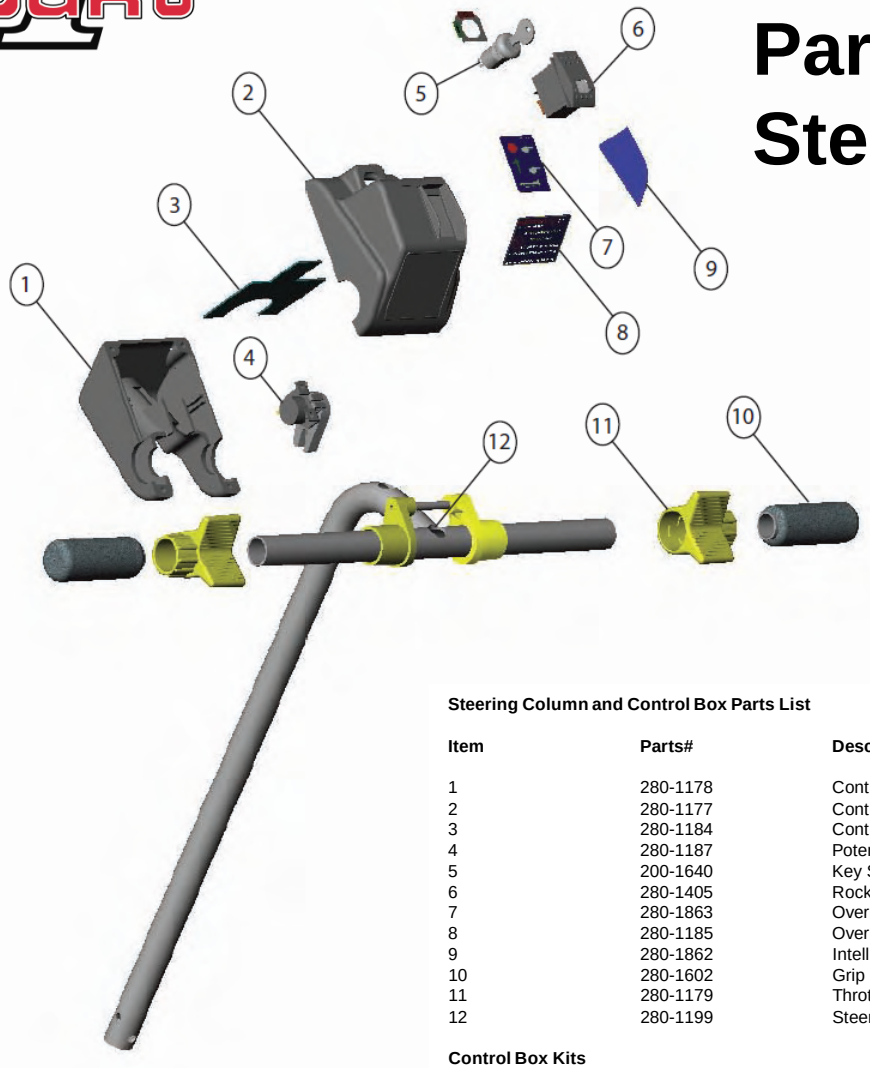
Parts List – Steering Column



Steering Column and Control Box Parts List

Item	Parts#	Description
1	280-1178	Control Box Bottom Cover
2	280-1177	Control Box Top Cover
3	280-1184	Control Box Divider
4	280-1187	Potentiometer Assembly
5	200-1640	Key Switch (Optional)
6	280-1405	Rocker Switch
7	280-1863	Overlay – Control Box Top
8	280-1185	Overlay – Control Box Front
9	280-1862	Intelli-Charge Indicator Decal
10	280-1602	Grip
11	280-1179	Throttle Grip – Thumb Control
12	280-1199	Steering Column (w/Rod and Grips)
Control Box Kits		
	280-1228	Control Box – Keyless (1-4, 6-8)
	280-1229	Control Box – Keyed (1-8)
	280-1230	Control Box Top – Keyless (2, 4, 6-8)
	280-1231	Control Box Top – Keyed (2, 4-8)
	280-1232	Control Box Top – w/Decals (2, 7, 8)

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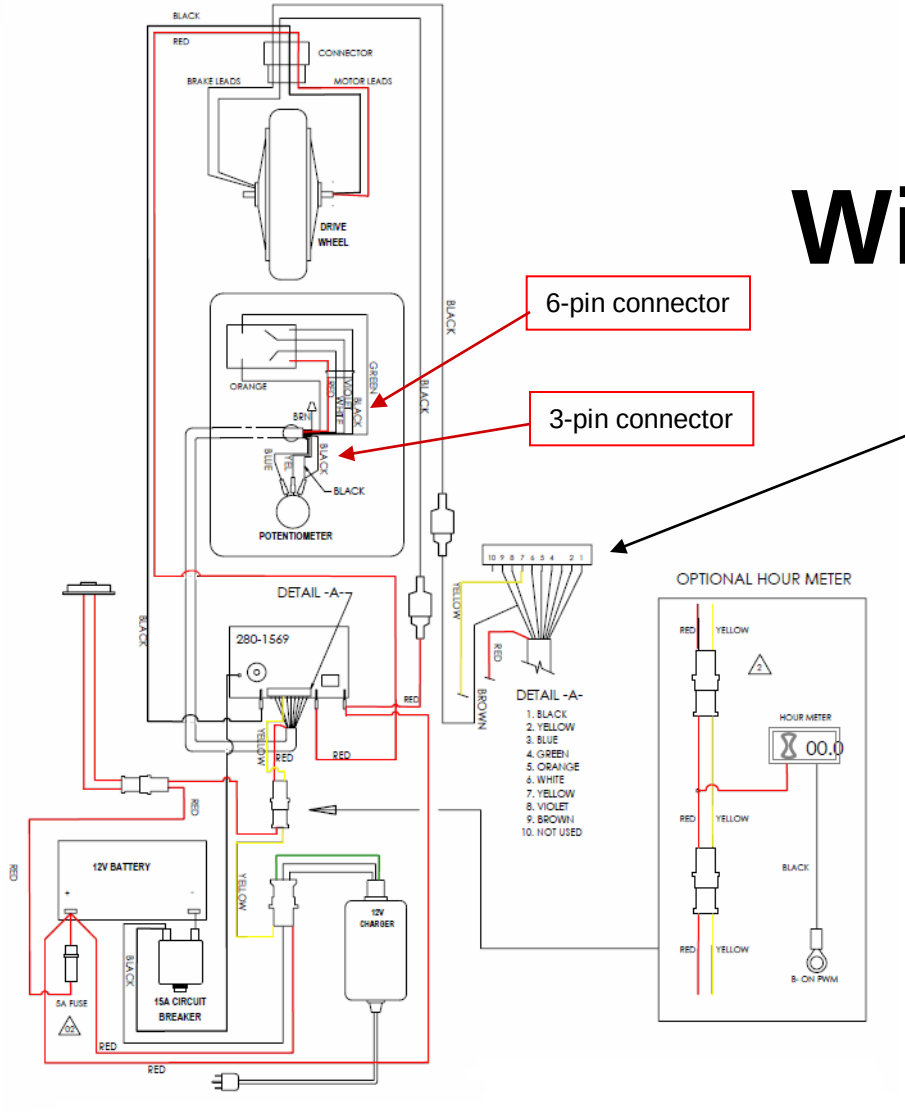
Wiring Diagram



6-pin connector

3-pin connector

1 – Black – Pin 1 on pot (Neg)
2 – Yellow – Pin 2 on pot (wiper)
3 – Blue – Pin 3 on pot (terminal)
4 – Green – LED
5 – Orange – LED
6 – White – Power (Pos)
7 – Yellow – Inhibit from charger
8 – Violet – Horn
9 – Brown – Brake
10 – Not used

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Tools

The suggested tool kit should contain:

Screwdrivers:	#2 Phillips	Sockets:	5/16”
	T15 Star		1/4”
	#2 Flat Head		7/16”
			1/2” Deep Well
Wrenches:	3/4” Open End		1/2”
	1/2” Open End		10mm
	1/2” Box End		
	10mm Open End	Pliers:	Needle Nose
	Torque		Regular
			Wire Snips
Punch or Nail:	1/8”		

Electronics: **Multi-meter** **-** Ohms, AC and DC voltage
Load Tester - Should be able to load test battery without having to charger the battery first
Jumper cable- Alligator clips on both ends

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Safety Check

This checklist is designed for service technicians to use as a guideline when servicing electrical Mart Cart shopping carts. The list covers common system safety features that should be checked for proper installation and functionality. While they may not be presented on this list, all parts and components of the cart should be checked for proper functionality and either fixed or reported to authorized facility personnel. All parts must be OEM to ensure proper safety and warranty compliance.

- **General Condition** – Check for broken frame, tubes, bumpers (frame and basket), basket, handlebars, covers, seats, and armrests. Any part or piece that may snag a person or store display should be repaired. All mounting screws (e.g. front cover screws) should be checked and replaced as necessary.
- **Electrical components** – Check all wiring to ensure no evidence of fraying, crimps or cuts. Ensure that the harness is laying inside the rear pan and not in a bind or contact with metal parts or components that could rub through the insulation (for example – between the seat tube and frame on an XTi model cart). Ensure proper circuit breakers are installed and functional.
- **Charger cord –** In addition to the other electrical components, check for fraying of charger cord and cord plug for damage. Replace with OEM cord. It is not recommended to replace plug.
- **Casters** – Check for proper distance from the floor (about ½ inch). Check for bracket welds and position (perpendicular to the floor).
- **Seat Latch** – Ensure that the latch engages properly and that it secures the seat from tilting forward.
- **Horn** – Check for proper functionality and audible level. The horn should activate when pressed and when the cart is moving in reverse.
- **Grips** – Check the grips on the handlebars to ensure that they firmly grasp. The grips should not be easily twisted or removed.
- **Charger** – Check the “inhibit” functionality of the charger. Ensure that the cart does not move under power when plugged into a power outlet and charging the battery.
- **Seat Switch** – Ensure that the cart only moves under power **ONLY** when someone is sitting in the seat. Occasionally, the seat switch may be bypassed (jumpered) during cart maintenance to facilitate problem diagnosis. **Never leave the seat switch bypassed for normal operation**.
- **Wheels and Axle** – Ensure that wheels are properly aligned, bearings are functional, and axle is not bent or bowed. Check for flat spots and wear.

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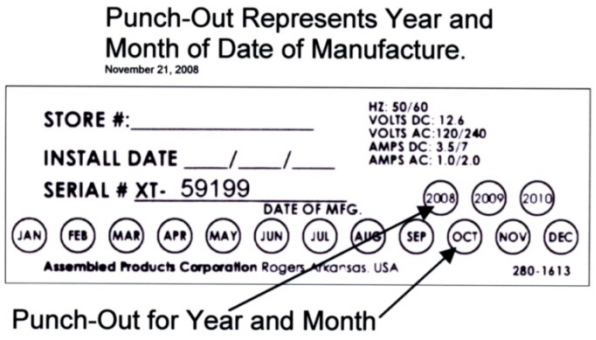
Warranty

The warranty period is calculated from the month and year of manufacture. The month and year of manufacture is determined by the punch-out positions on the serial number label.

In a standard, 2-year warranty period, a cart would be out of warranty in 2 years on the month following the month punched out.

Example: Cart built October, 2008 would be in warranty through October, 2010.

Warranty periods can differ from customer to customer. Please call our Service department for verification of warranty periods.


Punch-Out Represents Year and Month of Date of Manufacture.
November 21, 2008
STORE #:
INSTALL DATE ___/___/___
SERIAL # XT- 59199
HZ: 50/60
VOLTS DC: 12.6
VOLTS AC:120/240
AMPS DC: 3.5/7
AMPS AC: 1.0/2.0
DATE OF MFG.
2008 2009 2010
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Assembled Products Corporation Rogers, Arkansas USA
280-1613
Punch-Out for Year and Month

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mart cart

LIMITED WARRANTY

2-2-2

SKU # 280-1668 - Special Warranty #5

A. Parts: Parts are warranted for two years from date of shipment.

All parts are warranted by the manufacturer to be free from defects in material and workmanship. This warranty does not include wear and tear caused by abuse, negligence, freight damage, damage caused by improper use or care, damage caused by scrapes, cuts or dents, or by outside sources such as fire, flood, etc. Wear items such as seats, armrests, keys, and charger cords are not covered. Resetting a circuit breaker is not covered.

Parts ordered and replaced outside the initial cart warranty period carry a 90-day warranty to be free from defects in material and workmanship.

B. Battery: Batteries are warranted for two years from date of shipment.

Before submitting a warranty claim on a battery, the battery must be charged to a **full charge** (refer to your model's user manual for proper charging instructions) and should be load tested. If the battery does not fully charge or if the load test falls below 220CCA (Cold Cranking Amps), the battery will be replaced under warranty.

Replacement batteries carry a warranty period of 6 months or the remainder of the cart warranty period, whichever is longer.

C. Labor and Travel: Labor and travel charges are warranted for two years from date of shipment.

The manufacturer will cover labor and travel charges incurred as a result of defects in the materials and workmanship of the cart, when work is done by an approved service technician. Labor and travel charges for servicing wear items such as seats, armrests, keys, and charger cords are not covered. Labor and travel charges for resetting circuit breakers are not covered.

Labor is defined as the time spent physically servicing the cart at the facility where the cart is normally operated. Travel is defined as the trip charge, zone charge, mileage, or drive time required by service personnel. Travel charges may not include meals, fuel, or lodging.

Warranty periods and procedures are optional and may differ between customers. Please call our Service department with your cart's serial number to verity your specific options.

Serial Number

In the US, all warranty claims should be called in to 800-548-3373 (toll free). International warranty claims should be called in to (1+) 479-636-5776. Ask for Service. You may also email techservice@assembledproducts.com.
Please provide serial number for warranty verification when requesting service.

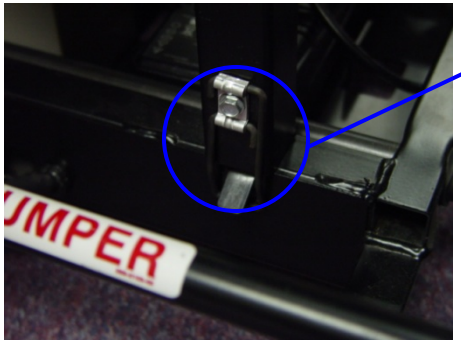
Serial Number Label

The serial number label is located underneath the rear cover. The manufacture date is represented by the year and month "punch-out" as shown below (review the previous page for warranty period information.

Lift the spring loaded seat latch (hidden below the cover) and push forward on the seat to reveal the label.

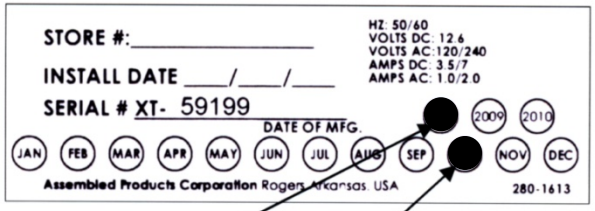
SN Label Location

Latch



Punch-Out Represents Year and Month of Date of Manufacture.

November 21, 2008



Punch-Out for Year and Month

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